

CLAIM AMENDMENTS

1 1. (withdrawn) A method of selectively detecting and/or
2 quantifying super paramagnetic and/or ferro magnetic particles,
3 characterized in that based upon the nonlinearity of the
4 magnetization characteristics of the particles, frequency
5 components of magnetic fields generated by their magnetization are
6 measured in terms of mixed frequencies.

1 2. (withdrawn) The method according to claim 1,
2 characterized in that the particles, for modulating their
3 magnetization characteristics (5) , are subjected to a modulating
4 magnetic field (4, 18) of predetermined frequency.

1 3. (withdrawn) The method according to claim in which
2 the modulating magnetic field (4, 18) has a frequency between 50
3 and 100 hertz.

1 4. (withdrawn) The method according to claim 1
2 characterized in that the particles are subjected to a scanning
3 magnetic field (15) with a frequency different from the modulating
4 magnetic field (4, 18).

1 5. (withdrawn) The method according to claim 1 in which
2 the scanning magnetic field (15) has a frequency between 10 and 100
3 kilo hertz.

1 6. (withdrawn) The method according to claim 1
2 characterized in that a response magnetic field (19) of the
3 particle induced by the effect of the two alternating magnetic
4 fields (15, 18) thereon is measured.

1 7. (withdrawn) The method according to claim 1,
2 characterized in that the amplitude variation (8, 11) of the
3 response magnetic field (19) is measured at the frequency of the
4 scanning magnetic field (15).

1 8. (withdrawn) The method according to claim 1 in which
2 the frequency components of the amplitude variation (8, 11) of the
3 response magnetic field (19) at the frequency of the scanning
4 magnetic field (15) are measured as whole number multiple of the
5 frequency of the modulating magnetic field (4, 18).

1 9. (withdrawn) The method according to claim 1 in which
2 the frequency components of the amplitude variation (8, 11) of the
3 response magnetic field (19) to the frequency of the scanning
4 magnetic field (15) are measured for the even number multiple of
5 the frequency of the modulating magnetic field (4, 18).

6 10. (withdrawn) The method according to claim 1 in
7 which the frequency components of the amplitude variation (8, 11)
8 of the response magnetic field (19) to the frequency of the
9 scanning magnetic field (15) is measured, for the signal which is
10 twice the frequency of the modulating magnetic field (4, 18).

1 11. (withdrawn) The method according to claim 1
2 characterized in that the amplitude variation (11) of the response
3 magnetic field (19) is converted and as an output voltage (24) is
4 used to determine the concentration of the analyte.

1 12. (currently amended) A device for the selective
2 detection and/or quantification of super power magnetic and/or
3 thermal magnetic particles with analytes, comprising:

4 a vessel ~~[[12]]~~ with an analyte to be detected or to be
5 quantified,

6 at least one oscillator ~~(13, 16, 25)~~ for producing
7 frequencies of alternating magnetic fields ~~(15, 18)~~,

8 at least one field generator ~~(14, 17)~~ for subjecting the
9 analyte to alternating magnetic field ~~(15, 18)~~,

10 a magnetic field sensor ~~[[20]]~~ for measuring a response
11 magnetic field ~~[[19]]~~ of the particles, and

12 at least one phase sensitive detector ~~(21, 23)~~.

1 13. (currently amended) The device according to claim
2 12 comprising at least one frequency dividers ~~{26, 27, 28, 29, 30}~~
3 for dividing the frequency of the oscillator ~~[[25]]~~.

1 14. (currently amended) The device according to claim
2 13 ~~characterized in that~~ wherein the frequency divider or frequency
3 dividers ~~{26, 27, 28, 29, 30}~~ divide the oscillator frequency in
4 proportions of whole positive numbers.

1 15. (currently amended) The device according to claim
2 13, ~~characterized in that~~ wherein the frequency dividers ~~{26, 27,~~
3 ~~28}~~ divide the oscillator frequency into the ratios
4 $1/l$, $1/m*n$, and $1/n$,
5 where l, m, and n are positive whole numbers.

1 16. (currently amended) The device according to claim
2 13 ~~characterized in that~~ wherein the frequency dividers ~~{28, 29,~~
3 ~~30}~~ divide the oscillator frequency in the ratios of
4 $1/(n + m)$, $1/n(n+m)$, and $1/n$,
5 where m and n are positive whole numbers.

17. (canceled)

1 18. (currently amended) The device according to claim
2 15 with m as an even number , ~~especially with m=2.~~

1 19. (currently amended) The device according to claim
2 13 with at least one frequency divider ~~(26, 28)~~ dividing the
3 oscillator frequency into a reference frequency which is stored in
4 at least one phase sensitive detector ~~(21, 23)~~.

1 20. (currently amended) The device according to claim 1
2 in which a frequency from one frequency divider ~~[(26)]~~ of the
3 oscillator frequency is stored as a reference in one phase
4 sensitive detector ~~[(21)]~~ and a frequency from another frequency
5 divider ~~[(28)]~~ dividing the oscillator frequency is stored as a
6 reference in another phase sensitive detector ~~[(23)]~~.

1 21. (currently amended) The device according to claim
2 13, ~~characterized in that~~ wherein field generators ~~(14, 17)~~ are
3 provided which are controlled by the frequencies of the frequency
4 dividers ~~(26, 27, 29, 30)~~.

1 22. (currently amended) The device according to claim
2 12 comprising at least one frequency multiplier ~~[(22)]~~.

1 23. (currently amended) The device according to claim
2 12, ~~characterized in that~~ wherein the magnetic field sensor
3 ~~[[20]]~~ is configured as a differential field sensor.

1 24. (currently amended) The device according to claim
2 12, ~~characterized in that~~ wherein the magnetic field sensor
3 ~~[[20]]~~ comprises two partial coils of the same construction type.

1 25. (currently amended) The device according to claim
2 12, ~~characterized in that~~ wherein the partial coils of the magnetic
3 field sensor ~~[[20]]~~ are wound in opposite sensors.

1 26. (currently amended) The device according to claim
2 12 ~~characterized in that~~ wherein the partial coils of the magnetic
3 field sensor ~~[[20]]~~ are connected in series.

1 27. (currently amended) The device according to claim
2 12, ~~characterized in that~~ wherein the container with the analyte is
3 in contact with only one of the two partial coils of the magnetic
4 field sensor ~~[[20]]~~.